# ECE 375 PRELAB FOR LAB 2

C → Assembler → Machine Code → Tekbot

**Lab Time: Friday 4 - 6**

*Faaiq Waqar*

## PreLab Questions

The ATmega128 microcontroller has seven general-purpose input-output (I/O) ports: Port A through Port G. An I/O port is a collection of pins, and these pins can be individually configured to send (output) or receive (input) a single binary bit. Each port has three I/O registers, which are used to control the behavior of its pins: PORTx, DDRx, and PINx. (The "x" is just a generic notation; for example, Port A's three I/O registers are PORTA, DDRA, and PINA.)

*1) Suppose you want to configure Port B so that all 8 of its pins are configured as outputs. Which I/O register is used to make this configuration, and what 8-bit binary value must be written to configure all 8 pins as outputs?*

For all ports, it is the data direction register, or DDRx that is used to control whether these data lines function as input or output. If for the specific port B, one wanted to configure all 8 pins as output, the binary of all 1's would be used on the DDRB specific port in order to send all the bits to outputs.

*2) Suppose all 8 of Port D's pins have been configured as inputs. Which I/O register must be used to read the current state of Port D's pins?*

In The textbook, the PINX Register description reads its utility to be "used to input data from the port pins". because of this utility, it is the PIND register for PINDn (7-0) that would determine the current state of Port D's pins.

*3) Does the function of a PORTx register differ depending on the setting of its corresponding DDRx register? If so, explain any difference*

**I used an internet resource to help me with this problem, alongside Ben Lee's book, link to the site:**

**https://www.elecrom.com/avr-tutorial-2-avr-input-output/**

Answer:

The PORTx register does depend on the current state of the DDRx register. , as the PORTx register is used to output onto the port pins, and the DDRx register is used to control if the lines corresponding are set to input or output. If the DDRx register is set to output or 1, tjen the respective bits that have been set to one n = (7-0), those bits can be written to in the PORTx register. If the DDRx is respectively set to 0, or input, then the corresponding PORTx register is then used to activate pull up resistors associated with the specific pin, depending on whether the PORTx register is set to 1, for activation of the pull up resistor, or 0, which is used to deactivate the pull up resistor.